What drove the cryptocurrency exchange (FTX's) epic collapse?

Max R. Chellew

Apirl 22, 2023

Abstract

The collapse of FTX, sent shock waves through the global financial markets, leaving many speculating about the driving factors behind this catastrophic event. This paper aims to discuss the potential factors that may have led to the demise of the cryptocurrency exchange. First outlining a concise timeline of the key events that took place before FTX's downfall. The paper then explores the effect of poor risk management and how the misuse of FTX's in-house token, FTT, created an environment in which a collapse was possible if FTT's value was to fall. This is followed by a short analysis of FTT and its falling value. Which identifies potential classical and behavioural reasons for its fall in value relating to tweets and other significant factors that correlate with the large drops in value. The paper concludes by addressing the call for regulatory oversight of crypto-exchanges in response to FTX's demise, while also questioning the appropriateness of this approach.

Keywords: Exchange, Cryptocurrency, FTX, Alameda Research, FTT Token, Binance, Availability bias, Repressive bias, Hearding bias, Financialization

1 Introduction

FTX, a cryptocurrency exchange, was founded by Sam Bankman-Fried (SBF) in May 2019 and propelled by the reputation of Alameda Research (Alemenda); a quantitative cryptocurrency trading firm SBF had co-founded two years prior to FTX (Mack 2022). Although these companies were labelled as separate entities, their intimate relationship would later spark the embers of what would become the collapse of FTX (Singh 2022).

On September 16th 2022, Bloomberg released an investigatory report on the relationship between FTX and Alameda following its clear violation of what would have been a conflict of interest, given FTX was instead an exchange for non-crypto financial instruments (Massa et al. 2022). The report informed on speculation of Alameda remaining a large market maker within FTX. On November 2nd, Coindesk released a report following leaks of Alameda's balance sheet further confirming Bloomergs earlier report. The crux of Coindesk's report was that Alameda's balance sheet was full of FTT, FTX's native and centrally controlled token (Allison 2022). Alameda's large equity stake in FTT was a huge risk implication since FTT was a centralized token printed out of thin air by FTX and gained its utility from the trading discounts offered for using FTT on the exchange (Morris 2022). In response to Coindesk's report, on November 6th, Binance a direct competitor and original investor of FTX announced to sell all holdings of FTT (Zahn 2022). Binance CEO, Changpeng Zhao (CZ), also drew a comparison between FTT and Luna, a cryptocurrency that experienced a significant market downturn from May to July 2022, in a partner announcement aimed at providing further clarification (Boom 2022). On November 7th, FTX entered into a liquidity crisis due to mass withdrawals and seeked bailout (Reiff 2023). On November 8th, Binance agreed to enter a non-binding agreement to buy FTX with FTT prices also falling by 80% (Mack 2022). On November 9th, Binance backed out of its acquisition deal after completing due diligence (Reiff 2023). On November 10th, SBF admitted a non-US liquidity crisis and Alameda Research announced they would be winding down. On November 11th, SBF stepped down from CEO of FTX and was replaced with John Ray who was responsible for Enron's bankruptcy proceedings. Later that day, FTX and FTX-US filed for Chapter 11 bankruptcy protection along with other affiliates

See Figure 1, for a visual depiction of key events that occurred during FTX's epic collapse.

May to July of 2022	Terra-Luna Crypto Collapse
Sep 16th 2022	Bloomberg releases report
Nov 2nd 2022	Coindesk releases report
Nov 6th 2022	Binance CEO announces to sells all holdings of FTT
	Binance CEO compares FTT risk to Luna
Nov 7th 2022	FTX enters into a liquidity crisis seeking bail out
Nov 8th 2022	Binance enters into a non-binding agreement to buy FTX
	FTT price Falls by 80%
Nov 9th 2022	Binance walks away form of FTX acquisition
Nov 10th 2022	Bankman-Fried admits non-U.S. businesses' liquidity crisis
	Alameda Research announce they are winding down
Nov 11th 2022	Bankman-Fried steps down as FTX CEO and replcaed with
	FTX files for Chapter 11 bankruptcy protection

Figure 1: Timeline of key events in FTX's collapse

2 Analysis

Despite not being public information during the timeline of FTX's collapse, FTX's November 10^{th} balance sheet (Alphaville 2022) gives important insight into its liquidity crisis. Following Conlon, Corbet & Hu (2022) analysis of a pro forma portfolio constructed with weights equal to those found in the reported FTX balance sheet; one finds a large discrepancy between lower tail risk measures of assets and liabilities held by FTX (see Table 1). Indicating that FTX's financial stability and ability to meet obligations would have been significantly impacted if asset's were subjected to large negative changes in value. This is important because FTT, SRM and SOL, characterised as "less liquid" assets on the balance sheet, account for 69% of all assets held by FTX (Conlon et al. 2022). Out of these three tokens, FTT and SRM had significantly higher book values compared to market capitalisation. FTX, therefore, was accounting for the uncirculated supply of FTT and SRM on its internal balance sheet, implying that the actual circulating supply of FTT and SRM may have been less than what was reflected in the market capitalization (Conlon et al. 2022). This can be supported by the trading volume of these two assets as done in Conlon, Corbet & Hu (2022). Meaning that FTT and SRM, labelled as "less liquid" assets, were instead extremely illiquid due to the amount of FTT and SRM held by FTX (Conlon et al. 2022).

lower tail risk measures	**Liabilities**	**Assets**
VaR 99%	-3.18	-11.18
VaR 95%	-1.74	-6.06
CVaR 99%	-5.11	-12.38
CVaR 95%	-2.99	-9.23

Table 1: Historical Simulation Downside Risk Estimates (Conlon et al. 2022).

Note: This table uses historical data over the period 1st November 2021 through 31st October 2022, to estimate summary statistics and risk characteristics associated with the assets and liabilities held by TFX as of 31st October 2022. Historical simulation is a non-parametric approach using historical data. VaR is value-at-risk, while CVaR is conditional value-at-risk or expected shortfall. Each tail measure is multiplied by minus one for clarity.

A surface-level explanation therefore would suggest that FTX's failure to fulfil its financial obligations was caused by the illiquidity of assets held by FTX and the decrease in FTT's value, however, this explanation is incomplete. As mentioned before FTT is FTX's non-collateral native utility token, mainly used on the centralised exchange to lower trading fees (Fu et al. 2022). FTT, therefore, was never backed by any assets and yet was used to prop up the value of both Alameda and FTX despite this. Vidal-Tomás, Briola & Aste (2023) gives a persuasive augment for this. Since the initial coin offering in 2019, both Alameda and FTX controlled a combined 80% capitalisation of FTT, leaving 20% to circulate the market (Li Khoo et al. 2022). Control over supply and demand was therefore in the hand of both these companies and thus so was the price of FTT (Vidal-Tomás et al. 2023). By inflating the price of FTT, both companies could increase their balance sheet value and utilize leveraging mechanisms to obtain additional financing as FTT had little liquidity to start with (Wigglesworth 2022). In the case of Alameda, as reported, FTT was used as collateral to gain financing for their risky investments (Rooney 2022). The question, therefore, remains as to why Alameda and FTX were unable to maintain the value of FTT during the height of FTX's controversy.

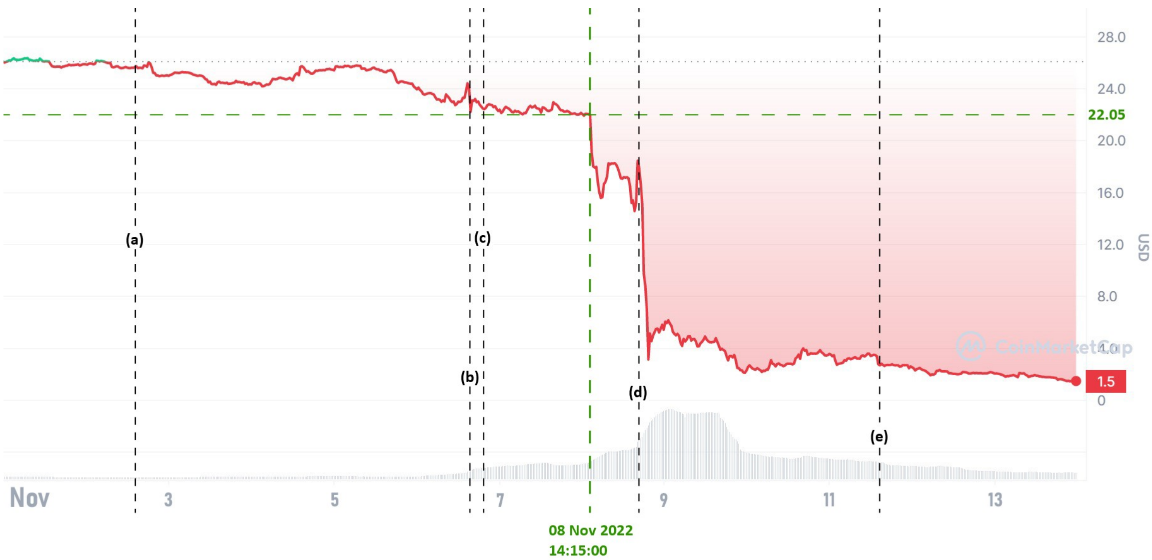


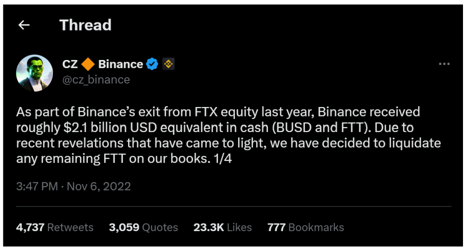
Figure 2: Five minute closing prices for FTT from 01 November 2022 to 13 November 2022 (CoinMarketCap 2023). Events listed in figure notes are plotted with dotted lines.

Note: (a) Coindesk article (Allison 2022), (b) CZ's tweet to sell FTT (see Figure 3a), (c) CZ's tweet elaborating on Binance's selling position of FTT (see Figure 3b), (d) CZ's tweet for Binance to enter a non-binding agreement to buy FTX (see Figure 3d), (e) FTX announces for bankruptcy (Reiff 2023).

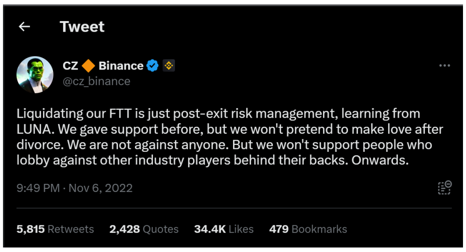
Information efficiency may have played some role in FTT's decline as declines in value are seen after Coinbases report on November 2nd (See Figure 2). Due to a lack of imposed regulation on both FTX and Alameda, neither company produced public information regarding their financials (Wilson et al. 2022); thus leaving any related information surrounding FTT private. The value of FTT, following the Efficient Market Hypothesis, should therefore change under any information efficiency shift (Downey 2023). However, this could not have produced the 80% decrease in FTT's value seen later on on the timeline of FTX's collapse as information surrounding FTX and FTT was still incomplete at the time Nicenko (2022).

Fast forward to November 8thth, CZ announced on Twitter that Binance would be selling all holdings of FTT as well as citing the recent collapse of the Terra-Lunna cryptocurrency as the reason for this decision (see Figure 3a & 3b). Note that a large proportion of FTX's clients would have been novice investors, as a consequence of their aggressive and mainstream marketing strategies aimed at such people (Elliott 2021). Thus, it is reasonable to assume that CZ's tweets had a profound effect on clients of FTX in terms of cognitive biases.

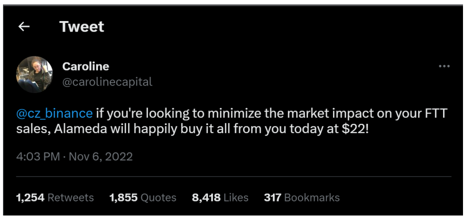
Since novice investors may have had limited information resources, they would have been subjected to an availability bias (Baddeley 2017) from which they based their decisions. In addition, CZ's direct comparison of FTT to the Terra-Lunna collapse could have imposed a repressive bias (Baddeley 2017) on investors. Which may have exacerbated the potential losses surrounding FTX and FTT in investors' minds. It's also likely that a herding bias (Baddeley 2017) played a large role in investor's decision-making, with "fast thinking" (Kahneman 2012) responses to CZ's tweets being more susceptible to this bias than that of "slow thinking" (Baddeley 2017). Even if this was not the case for slow-thinking investors, it still seemed rational to follow the same actions to that of fast thinking investors. Twitter's impact on public sentiment is established and has been known to move markets due to



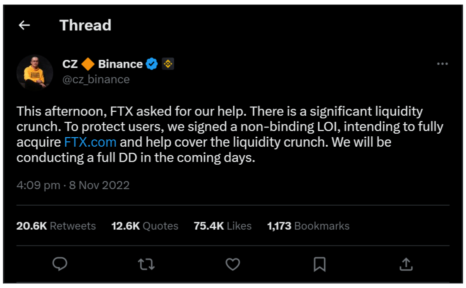
(a) Binance CEO tweets to sell all holdings of FTT (Changpeng 2022*a*)



(b) Binance CEO tweets to explain further on selling position of FTT (Changpeng 2022*b*)



(c) Alameda CEO tweets to buy FTT for $22 (Ellison 2022).



(d) Binance CEO tweets potential acquisition of FTX due to liquidity crunch (Changpeng 2022*c*)

Figure 3: Tweets

spikes in the volume of trades (Bollen et al. 2011). As more people choose to follow in the footsteps of CZ by cutting ties with FTX, the public shifts to a more bearish perspective, which could result in increases in the number of bearish tweets seen on Twitter. This could have led to investors perceiving a higher probability of loss due to seeing more people join the herd. With the perceived utility for an investor moving in favour of joining the herd, so should their decision to join the herd.

These effects can be seen significantly at two major points. The first point was FTT hitting the value of $22 per token. A value and consequent support level (Chen 2022) set by Alameda's CEO after offering to buy Binance's FTT tokens (see Figure 3c), that resulted in FTT displaying breakout behaviours after falling bellow $22 (see Figure 2). The second point was when CZ tweeted about Binance's potential acquisition of FTX (see Figure 2 & 3d) since this announcement marked the tipping point for FTX between saviour or failure.

3 Conclusion

It's hard to argue that a lack of financial regulation does not tie into the issues surrounding FTX. Firstly, Alameda would not have been allowed to act as a market maker on FTX in a more traditional finance setting due to a conflict of interest (Oliver 2022). Which was found to be the initial cause and a major contributor to FTX's collapse. FTX was also not subject to any quarterly statements (Wilson et al. 2022) that provide non-private investors with information regarding its inner workings nor was it abiding by any risk management regulations as outlined in Section 2. Transparency and risk management are key preventative measures in any financial crisis which is why regulations like this are imposed on large financial entities. These regulations also act to improve market stability, efficiency and transparency (Arner et al. 2023). These are important factors, when building the trust between the exchange and client needed to avoid any herding behaviour during a liquidity crisis. There are also no regulations surrounding the use of in-house tokens which allows for miss uses and manipulation of these tokens as seen with FTT. The significance of FTT was major and without it, one can go as far as to say that FTX collapse would not have happened.

The collapse of FTX thus raises concerns for the regulatory oversight of crypto-exchanges. While imposing regulations may seem the correct thing to do, one could argue it instead adds to the underlying problem. Financialization (Arner et al. 2023) of cryptocurrencies offered by a centralized crypto-exchanges and by regulation, acts to undermine the core principles of a decentralized and trustless system for which crypto-currency was built upon (Nakamoto 2008). These principles are the backbone of avoiding problems such as ones displayed in FTX's collapse. Therefore rather than relying on human intervention through regulations, one should strive to instead create an exchange that embodies the founding ideals of crypto-currency (Arner et al. 2023). This will not only ensure a truly decentralized, permissionless, and trustless system but also eliminate the need for intermediaries and mitigates the risks of collapse.

References

Allison, I. (2022), 'Divisions in sam bankman-fried's crypto empire blur on his trading titan alameda's balance sheet'.
URL: *https://www.coindesk.com/business/2022/11/02/divisions-in-sam-bankman-frieds-crypto-empire-blur-on-his-trading-titan-alamedas-balance-sheet/*

Alphaville, F. (2022), 'Ftx balance sheet, revealed'.
URL: *https://www.ft.com/content/0c2a55b6-d34c-4685-8a8d-3c9628f1f185*

Arner, D. W., Zetzsche, D. A., Buckley, R. P. & Kirkwood, J. (2023), 'The financialization of crypto: Lessons from ftx and the crypto winter of 2022-2023', *SSRN Electronic Journal* .

Baddeley, M. (2017), *Behavioural economics: A very short introduction*, Oxford University Press.

Bollen, J., Mao, H. & Zeng, X. (2011), 'Twitter mood predicts the stock market', *Journal of Computational Science* **2**(1), 1–8.

Boom, D. V. (2022), 'Luna cryptocurrency collapse: How ust broke and why it matters'.
URL: *https://www.cnet.com/personal-finance/crypto/luna-crypto-crash-how-ust-broke-and-whats-next-for-terra/*

Changpeng, Z. (2022*a*), 'As part of binance's exit from ftx equity last year, binance received roughly $2.1 billion usd equivalent in cash (busd and ftt). due to recent revelations that have came to light, we have decided to liquidate any remaining ftt on our books. 1/4'.
URL: *https://twitter.com/cz_binance/status/1589283421704290306?lang=en*

Changpeng, Z. (2022*b*), 'Liquidating our ftt is just post-exit risk management, learning from luna. we gave support before, but we won't pretend to make love after divorce. we are not against anyone. but we won't support people who lobby against other industry players behind their backs. onwards.'.
URL: *https://twitter.com/cz_binance/status/1589374530413215744?lang=en*

Changpeng, Z. (2022*c*), 'This afternoon, ftx asked for our help. there is a significant liquidity crunch. to protect users, we signed a non-binding loi, intending to fully acquire https://t.co/bgtflcmlxb and help cover the liquidity crunch. we will be conducting a full dd in the coming days.'.
URL: *https://twitter.com/cz_binance/status/1590013613586411520?lang=en-GB*

Chen, J. (2022), 'What is the support level of a stock, and how do you trade it?'.
URL: *https://www.investopedia.com/terms/s/support.asp*

CoinMarketCap (2023), 'Ftx token price today, ftt to usd live, marketcap and chart'.
URL: *https://coinmarketcap.com/currencies/ftx-token/*

Conlon, T., Corbet, S. & Hu, Y. (2022), 'The collapse of ftx: The end of cryptocurrency's age of innocence', *SSRN Electronic Journal* .

Downey, L. (2023), 'Efficient market hypothesis (emh): Definition and critique'.
URL: *https://www.investopedia.com/terms/e/efficientmarkethypothesis.asp*

Elliott, S. (2021), ‘Ftx is spending big on marketing because ’we’re behind on name recognition’: Ceo’.
URL: *https://decrypt.co/85744/ftx-is-spending-big-on-marketing-because-were-behind-on-name-recognition-ceo*

Ellison, C. (2022), ‘cz_binance if you’re looking to minimize the market impact on your ftt sales, alameda will happily buy it all from you today at $22’.
URL: *https://twitter.com/carolinecapital/status/1589287457975304193?lang=en*

Fu, S., Wang, Q., Yu, J. & Chen, S. (2022), ‘Ftx collapse: A ponzi story’.

Kahneman, D. (2012), *Thinking, fast and slow*, Penguin.

Li Khoo, Y., Leow, S., Polk, N. & Chia, D. (2022), ‘Blockchain analysis: The collapse of alameda and ftx’.
URL: *https://www.nansen.ai/research/blockchain-analysis-the-collapse-of-alameda-and-ftx*

Mack, E. (2022), ‘The fall of ftx and sam bankman-fried: A timeline’.
URL: *https://www.cnet.com/personal-finance/crypto/the-fall-of-ftx-and-sam-bankman-fried-a-full-timeline-of-events/*

Massa, A., Irrera, A. & Miller, H. (2022), ‘Trading firm alameda research powers ftx ceo sam bankman-fried’s crypto empire’.
URL: *https://www.bloomberg.com/news/articles/2022-09-14/trading-firm-alameda-research-powers-ftx-ceo-sam-bankman-fried-s-crypto-empire*

Morris, D. Z. (2022), ‘What is a crypto exchange token and how did it help blow up ftx?’.
URL: *https://www.coindesk.com/layer2/2022/11/23/what-is-a-crypto-exchange-token-and-how-did-it-help-blow-up-ftx/*

Nakamoto, S. (2008), ‘A peer-to-peer electronic cash system’.
URL: *https://bitcoin.org/en/bitcoin-paper*

Nicenko, A. (2022), ‘Why is ftx token crashing? ftt plunges 80% wiping $2.5 billion from its market cap’.
URL: *https://finbold.com/why-is-ftx-token-crashing-ftt-plunges-80-wiping-2-5-billion-from-its-market-cap/*

Oliver, J. (2022), ‘’we kind of lost track’: How sam bankman-fried blurred lines between ...’.
URL: *https://financialpost.com/fp-finance/cryptocurrency/we-kind-of-lost-track-how-sam-bankman-fried-blurred-lines-between-ftx-and-alameda*

Reiff, N. (2023), ‘The collapse of ftx: What went wrong with the crypto exchange?’.
URL: *https://www.investopedia.com/what-went-wrong-with-ftx-6828447*

Rooney, K. (2022), ‘Sam bankman-fried’s alameda quietly used ftx customer funds for trading, say sources’.
URL: *https://www.cnbc.com/2022/11/13/sam-bankman-frieds-alameda-quietly-used-ftx-customer-funds-without-raising-alarm-bells-say-sources.html*

Singh, V. (2022), ‘Sam bankman-fried explains ftx-alameda relationship’.
URL: *https://coingape.com/sam-bankman-fried-explains-ftx-alameda-relationship/*

Vidal-Tomás, D., Briola, A. & Aste, T. (2023), 'Ftx's downfall and binance's consolidation: The fragility of centralized digital finance', *SSRN Electronic Journal* .

Wigglesworth, R. (2022), 'The alameda-ftx death spiral'.
URL: *https://www.ft.com/content/7a55d057-357d-4bf6-92c4-4fc4ef7f72db*

Wilson, T., Berwick, A. & Howcroft, E. (2022), 'Special report: Binance's books are a black box, filings show, as it tries to rally confidence'.
URL: *https://www.reuters.com/technology/binances-books-are-black-box-filings-show-crypto-giant-tries-rally-confidence-2022-12-19/*

Zahn, M. (2022), 'A timeline of cryptocurrency exchange ftx's historic collapse'.
URL: *https://abcnews.go.com/Business/timeline-cryptocurrency-exchange-ftxs-historic-collapse/story?id=93337035*